



Spectrum Devices Corporation

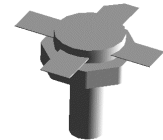
Semiconductor Engineering and Manufacturing

RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

HF50-150A

FEATURES:

- 30 MHz
- 50 Volts
- IMD -30 dB
- Common Emitter
- Gold Metallization
- $P_{out} = 150$ W PEP Min. with 14 dB Gain
- **Improved Collector-Base Breakdown Voltage: 175 Volts Min.**
- **Direct replacement for ST SD1727 (THX15)**



**0.500" DIAMETER
STUD PACKAGE**

DESCRIPTION:

The HF50-150A is a 50V epitaxial silicon NPN planar transistor designed primarily for SSB communications. This device utilizes emitter ballasting to achieve extreme ruggedness under severe operating conditions. The HF50-series products utilize the unique Spectrum Devices' Bipolar process which offers a 60% improvement in collector-base breakdown voltage, enhancing reliability while maintaining RF performance.

ABSOLUTE MAXIMUM RATINGS: ($T_{CASE} = 25^{\circ}C$)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	175	V
V_{CEO}	Collector-Emitter Voltage	55	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_C	Device Current	10	A
P_{DISS}	Total Dissipation	233	W
T_J	Junction Temperature	+200	$^{\circ}C$
T_{STG}	Storage Temperature	-65 to +150	$^{\circ}C$

THERMAL DATA:

$R_{TH(J-C)}$	Thermal Resistance Junction-case	0.75	$^{\circ}C/W$
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ELECTRICAL SPECIFICATIONS ($T_{CASE} = 25^{\circ}C$)

DC CHARACTERISTICS

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV_{CBO}	$I_C = 100\text{ mA}$ $I_E = 0\text{ mA}$	175	--	--	V
BV_{CES}	$I_C = 100\text{ mA}$ $V_{BE} = 0\text{ V}$	175	--	--	V
BV_{CEO}	$I_C = 100\text{ mA}$ $I_B = 0\text{ mA}$	55	--	--	V
BV_{EBO}	$I_E = 10\text{ mA}$ $I_C = 0\text{ mA}$	4.0	--	--	V
I_{CEO}	$V_{CE} = 30\text{ V}$ $I_E = 0\text{ mA}$	--	--	5	mA
I_{CES}	$V_{CE} = 60\text{ V}$ $I_E = 0\text{ mA}$	--	--	5	mA
h_{FE}	$V_{CE} = 6\text{ V}$ $I_C = 1.4\text{ A}$	18	--	43.5	--

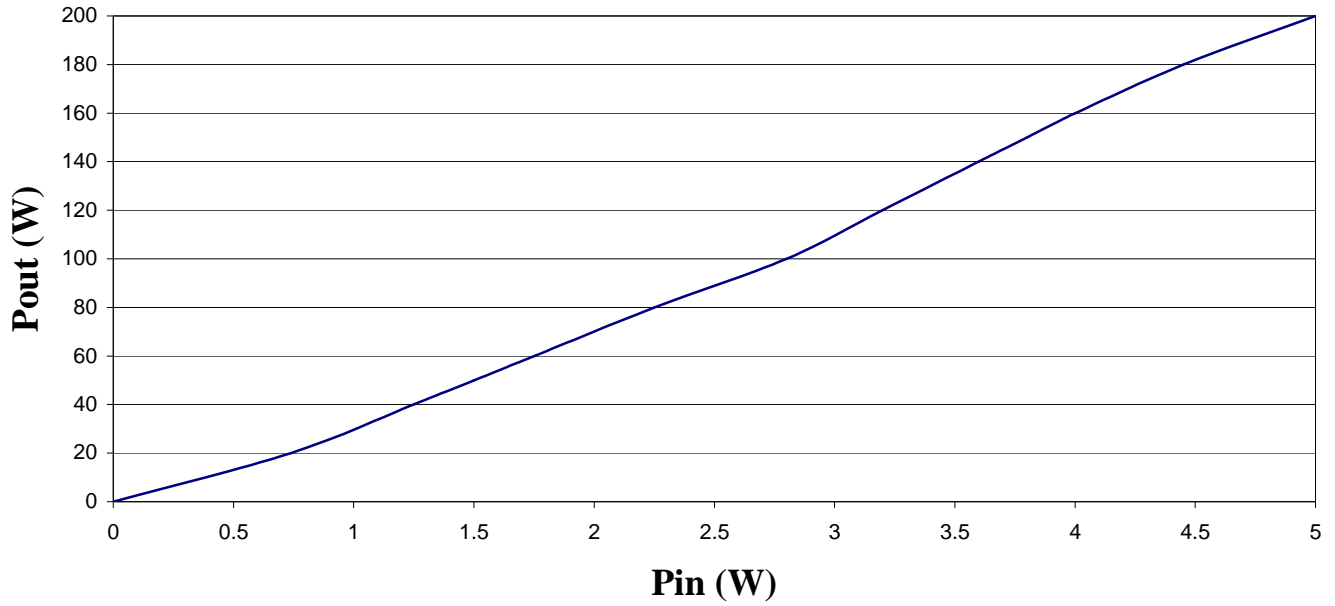
RF CHARACTERISTICS

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
P_{OUT}	$f = 30\text{ MHz}$ $V_{CC} = 50\text{ V}$ $I_{CQ} = 100\text{ mA}$	150	--	--	W PEP
G_P	$P_{out} = 150\text{ W PEP}$ $V_{CC} = 50\text{ V}$ $I_{CQ} = 100\text{ mA}$	14	--	--	dB
IMD*	$P_{out} = 150\text{ W PEP}$ $V_{CC} = 50\text{ V}$ $I_{CQ} = 100\text{ mA}$	--	--	-30	dBc
η_C	$P_{out} = 150\text{ W PEP}$ $V_{CC} = 50\text{ V}$ $I_{CQ} = 100\text{ mA}$	40	--	--	%
C_{OB}	$f = 1\text{ MHz}$ $V_{CB} = 50\text{ V}$	--	--	220	pF

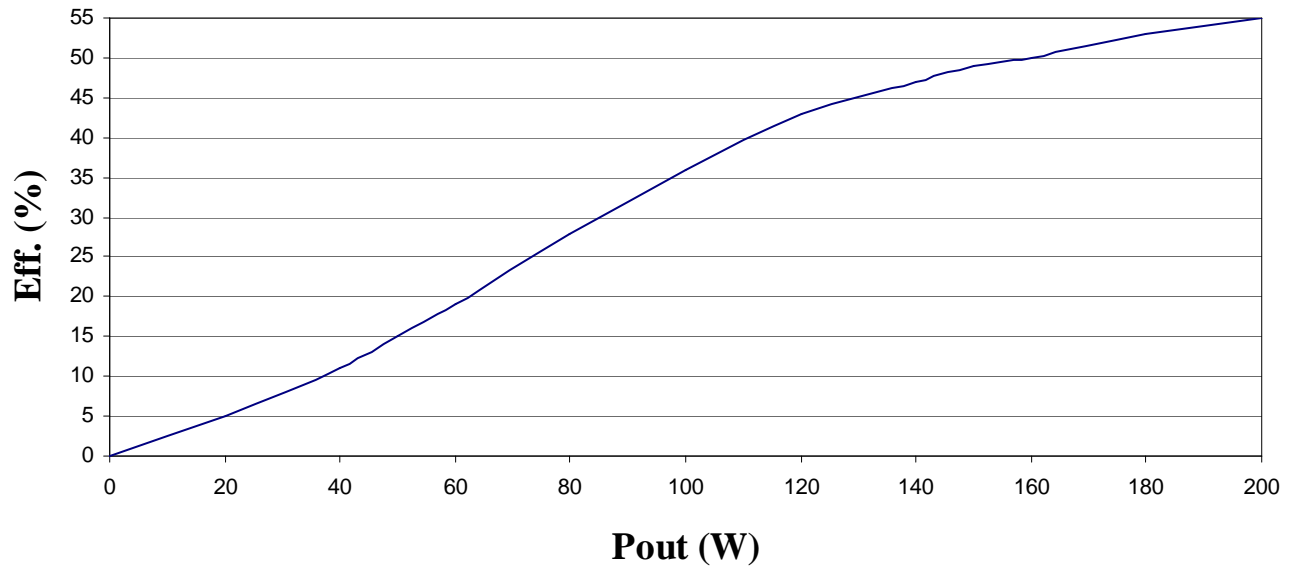
*Conditions $f_1 = 30.00\text{MHz}$ $f_2 = 30.001\text{MHz}$

TYPICAL PERFORMANCE

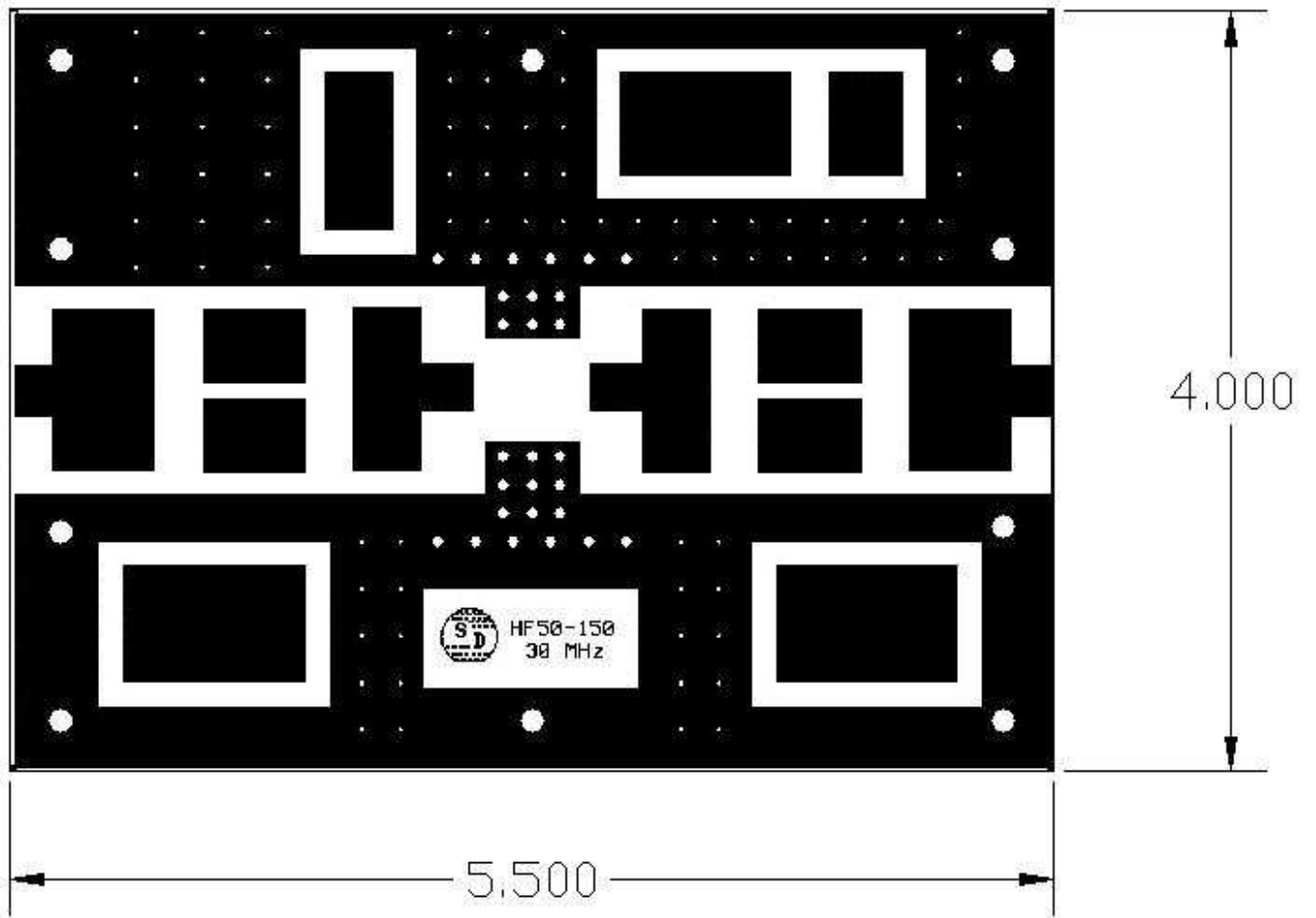
Power Output vs Power Input



Collector Efficiency vs. Power Output

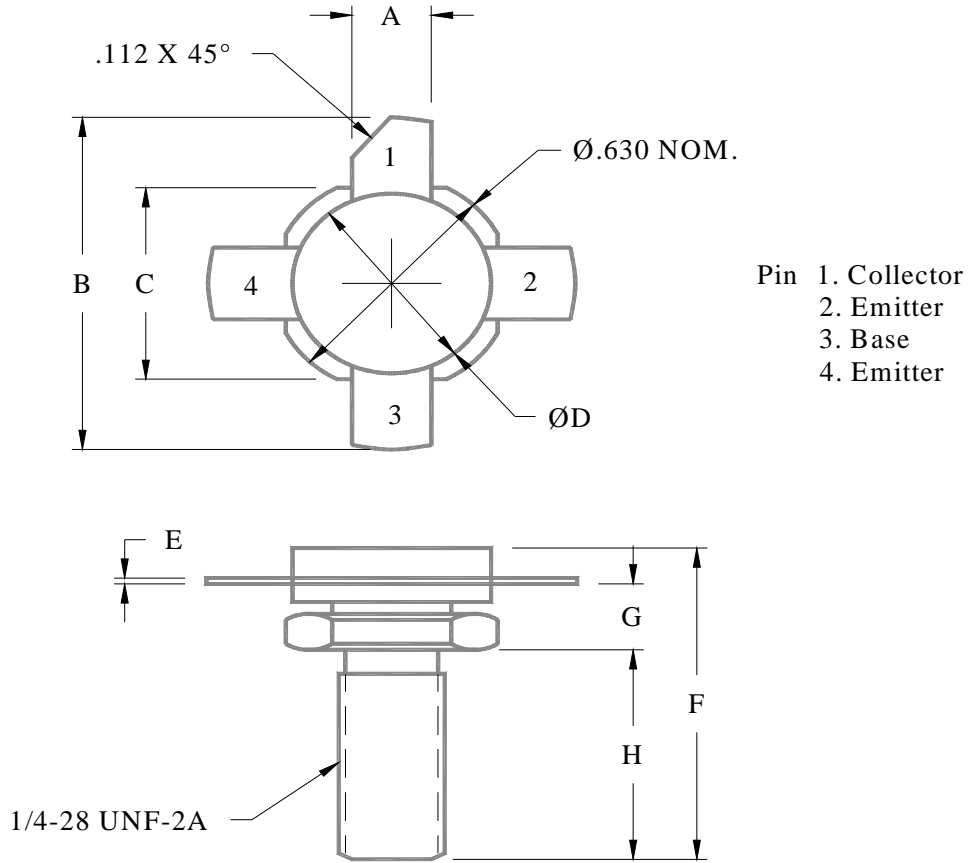


PCB BOARD LAYOUT



PACKAGE MECHANICAL DATA

SOE-500-Stud



	Minimum Inches/MM	Maximum Inches/MM		Minimum Inches/MM	Maximum Inches/MM
A	.220/5.59	.230/5.84	E	.003/0.08	.007/0.18
B		1.050/26.67	F		.810/20.57
C	.545/13.84	.555/14.10	G	.185/4.70	.198/5.03
D	.495/12.57	.505/12.83	H	.497/12.62	.530/13.46

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